

Claims:

1. An optical link module for connecting light beams by deflection, comprising:
light emitting devices arranged in a planar manner;
optical waveguides for receiving light beams from the light emitting devices; and
5 an optical bend which is disposed between the light emitting devices and the optical waveguides and includes a plurality of aspherical lenses formed in accordance with the number of the light emitting devices and the number of the optical waveguides.
2. The optical link module according to claim 1, wherein the optical bend is a prism,
10 and the aspherical lenses include a plurality of coaxial spherical surfaces having different radii.
3. The optical link module according to claim 1, wherein the light emitting devices are chosen from the group consisting of laser diodes and light emitting diodes.
- 15 4. The optical link module according to claim 1, wherein the optical waveguides are optical fibers.
5. The optical link module according to claim 1, wherein a surface on which the light
20 emitting devices are arranged and an incidence plane of the optical waveguides are disposed to intersect with each other.
6. The optical link module according to claim 1, wherein the aspherical lenses are concave lenses formed to protrude outward from an optical surface of the optical turn.
- 25 7. An optical interconnection method for connecting a plurality of parallel light beams

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by deflection to light receiving parts corresponding to the respective light beams from light emitting devices, the method comprising the steps of:

providing light emitting devices arranged in a planar manner;

providing light receiving parts for receiving light beams from the light emitting
5 devices; and

deflecting the light beams between the light emitting devices and the light receiving parts by using an optical turn which is disposed between the light emitting devices and the optical waveguides and includes a plurality of aspherical lenses formed in accordance with the number of the light emitting devices and the number of the optical waveguides.

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8. The optical interconnection method according to claim 7, wherein the step of deflecting the light beams further includes the steps of:

generating refractions with different curvatures by using the aspherical lenses corresponding to the light beams from the light emitting devices and by taking an optical
15 axis of each aspherical lens as a center; and

generating refractions with different curvatures by reflecting the light beams undergoing the refractions with the different curvatures and by using the corresponding aspherical lenses.

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9. The optical interconnection method according to claim 7, further comprising the step of generating the light beams by using a light source chosen from the group consisting of laser diodes and light emitting diodes.

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10. The optical interconnection method according to claim 7, further comprising the step of forming the light receiving parts by using any of ends of optical fibers and light receiving surfaces of photodiodes.

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11. The optical interconnection method according to claim 7, wherein a time delay of a light beam before reaching the light receiving part can be set to be equal among a plurality of light beams.

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12. An information processor which includes a central processing unit, a memory and an input/output unit, comprising:

an optical signal generation unit for generating optical signals from electrical signals by responding to instructions of the central processing unit;

10 optical waveguides which receive, by use of light receiving parts, the optical signals generated by the optical signal generation unit and transmit the optical signals; and

other devices which receive instructions from the central processing unit by receiving the light beams emitted from the optical waveguides and converting the light beams into electrical signals,

15 wherein the optical signal generation unit includes:

a driver part,

surface emitting elements driven by the driver part,

an optical turn including aspherical lenses which deflect light beams generated by the surface emitting elements and are formed in accordance with the light beams, and

20 a coupling member for coupling a plurality of optical waveguides with the deflected light beams.

13. The information processor according to claim 12, wherein a surface on which light emitting devices of the surface emitting elements are formed and a light receiving surface
25 of the light receiving part are disposed to intersect with each other.

14. The information processor according to claim 12, wherein the optical waveguides are optical fibers and the optical signal passes through the optical turn at the same time.

5 15. The information processor according to claim 12, wherein the optical waveguides are wiring elements in the information processor.

16. A signal transfer method in an information processor including at least a central processing unit, a memory and an input/output unit, the method comprising the steps of:

providing electrical signals based on instructions of the central processing unit;

10 generating a plurality of optical signals, in an optical signal generation unit, from the electrical signals;

transmitting the optical signals, which are generated by the optical signal generation unit, inside optical waveguides via light receiving parts; and

15 inputting instructions from the central processing unit into other devices by receiving the optical signals emitted from the optical waveguides and converting the optical signals into electrical signals,

wherein the step of generating optical signals includes the steps of

generating optical signals by driving surface emitting elements in response to the electrical signals,

20 deflecting a direction of the light beams transmission by use of an optical bend including aspherical lenses formed in accordance with the optical signals and

coupling the deflected light beams with a plurality of optical waveguides via the aspherical lenses formed in accordance with the light beams.

25 17. The signal transfer method according to claim 16 comprising deflecting the direction of the light beam by about 90 degrees by the use of an optical turn including spherical

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lenses formed in accordance with the optical signals.

18. The signal transfer method according to claim 16, wherein the step of deflecting the light beams further includes the step of generating refractions with a plurality of different curvatures by using the aspherical lenses corresponding to the light beams from the light emitting devices and by taking an optical axis of each aspherical lens as a center.

19. A prism used in an optical link module which deflects light beams in an information processor, comprising:

at least two optical surfaces through which the light beams pass; and
aspherical lenses formed on the optical surfaces.

20. The prism according to claim 19, wherein the aspherical lenses include a plurality of coaxial spherical surfaces with different radii.

21. A method of manufacturing a prism which is used in an optical link module deflecting light beams in an information processor and includes a plurality of aspherical lenses, the method comprising the steps of:

providing a mold including a plurality of surfaces, which include at least a flat surface and a plurality of aspherical concave portions, and a connection surface for connecting the plurality of surfaces;

introducing a plastic material into a space defined inside the mold; and

obtaining a prism in which aspherical lenses are formed at least on two optical surfaces by solidifying the plastic material,

wherein the step of providing the mold includes the steps of

forming a small-diameter concave portion while sloping a small-diameter cutting

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tool from a rotation axis on a surface of the mold and

forming a large-diameter concave portion while allowing a rotation axis of a large-diameter cutting tool to coincide with a central axis of the small-diameter concave portion.